



## The effect of high ambient temperature on the elderly population in three regions of Sweden

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### Abstract:

The short-term effects of high temperatures are a serious concern in the context of climate change. In areas that today have mild climates the research activity has been rather limited, despite the fact that differences in temperature susceptibility will play a fundamental role in understanding the exposure, acclimatization, adaptation and health risks of a changing climate. In addition, many studies employ biometeorological indexes without careful investigation of the regional heterogeneity in the impact of relative humidity. We aimed to investigate the effects of summer temperature and relative humidity and regional differences in three regions of Sweden allowing for heterogeneity of the effect over the scale of summer temperature. To do so, we collected mortality data for ages 65+ from Stockholm, Goteborg and Skane from the Swedish National Board of Health and Welfare and the Swedish Meteorological and Hydrological Institute for the years 1998 through 2005. In Stockholm and Skane on average 22 deaths per day occurred, while in Goteborg the mean frequency of daily deaths was 10. We fitted time-series regression models to estimate relative risks of high ambient temperatures on daily mortality using smooth functions to control for confounders, and estimated non-linear effects of exposure while allowing for auto-regressive correlation of observations within summers. The effect of temperature on mortality was found distributed over the same or following day, with statistically significant cumulative combined relative risk of about 5.1% (CI Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.3, 10.1) per degrees C above the 90th percentile of summer temperature. The effect of high relative humidity was statistically significant in only one of the regions, as was the effect of relative humidity (above 80th percentile) and temperature (above 90th percentile). In the southernmost region studied there appeared to be a significant increase in mortality with decreasing low summer temperatures that was not apparent in the two more northerly situated regions. The effects of warm temperatures on the elderly population in Sweden are rather strong and consistent across different regions after adjustment for mortality displacement. The impact of relative humidity appears to be different in regions, and may be a more important predictor of mortality in some areas.

**Source:** <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2905568>

### Resource Description

#### Exposure : ☐

weather or climate related pathway by which climate change affects health

Meteorological Factors, Temperature

# Climate Change and Human Health Literature Portal

**Temperature:** Extreme Heat

**Geographic Feature:** 

resource focuses on specific type of geography

Urban

**Geographic Location:** 

resource focuses on specific location

Non-United States

**Non-United States:** Europe

**European Region/Country:** European Country

**Other European Country :** Sweden

**Health Impact:** 

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

**Mitigation/Adaptation:** 

mitigation or adaptation strategy is a focus of resource

Adaptation

**Population of Concern:** A focus of content

**Population of Concern:** 

populations at particular risk or vulnerability to climate change impacts

Elderly

**Resource Type:** 

format or standard characteristic of resource

Research Article

**Timescale:** 

time period studied

Time Scale Unspecified